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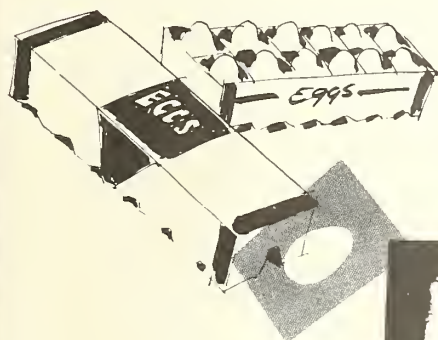
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# Dairy Products

in RETAIL FOOD STORES



Marketing Research Report No. 661

UNITED STATES DEPARTMENT OF AGRICULTURE  
Agricultural Marketing Service  
Transportation and Facilities Research Division

## PREFACE

This study deals with improving work methods, equipment, and layout in the retail dairy department of a supermarket. It is part of a broad program of research by the Agricultural Marketing Service aimed at holding down the costs of marketing farm products by increasing the efficiency of food wholesaling and retailing.

Increases in marketing costs are normally reflected back to the farmer in lower returns, or to the consumer in higher prices, or both, as competition among traders gradually adjusts costs and margins. Reduction of costs, therefore, can benefit all interested groups—producers, processors, distributors, and consumers.

The study was made under the general supervision of R. W. Hoecker, Chief, and the direct supervision of Paul F. Shaffer, Marketing Specialist, Wholesaling and Retailing Research Branch, Transportation and Facilities Research Division, AMS.

The Red Owl Stores, Inc., and Super Valu Stores of Minneapolis, Minn.; Giant Food Stores, Inc., and Safeway Stores, Inc., of Washington, D.C.; Penn Fruit Co. of Philadelphia, Pa., and many other firms contributed the use of their stores and packaging plants in conducting tests.

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## SUMMARY

Suggestions for improved dairy department work methods, equipment, and layout are made as a result of research in 12 supermarkets. The study evaluated handling techniques and three types of dairy display cases. More efficient work methods were developed for: Ordering, receiving, price marking, and stocking merchandise. A special study was made of handling egg cartons in wire baskets instead of the conventional fiberboard case.

Four categories of items contribute 70 percent of the total units sold and 69 percent of the total sales. Improving the handling of these four items (milk, butter, margarine, and eggs) has considerable laborsaving potential.

A record of past sales was incorporated into the order form for use as a guide in ordering. This is important in the dairy department, because 72 percent of the items sell less than a case a week.

The most effective method for receiving and taking the merchandise to the display area was on pallets. If the store doesn't have a dock, or if it is against store policy to allow pallets on the floor while the store is open, then the best method for transporting the merchandise is with either a six-wheel handtruck or a semilive skid.

A self-inking stick stamp set used in conjunction with an adjustable band stamp as compared with using only an adjustable band stamp would save \$162 per year in the average dairy department (sales of \$4,000 per week).

When larger loads are carried to the display area on the six-wheel truck and better work methods are used (the use of both hands simultaneously in placing items on display) substantial savings will result.

A new system for the shipping and the handling of eggs in the retail store made use of wire baskets instead of fiber cases. The wire baskets have a much longer life than the fiber case, and they can be positioned directly in the display case, which eliminates the individual handling of the cartons. Yearly labor and material savings are \$179. Other advantages from use of the wire baskets are lower material cost, better rotation, and less breakage.

Time studies showed that the stocking of rear-fed display cases required 16 percent less labor than the conventional multishelf display cases. Standards were developed for stocking the various items to serve as a guide in scheduling employees.

A study conducted in 12 stores to measure the effect three different types of display fixtures had on sales showed that there was no significant difference between cases. The results of observations of more than 1,300 customers in this study revealed that the type of display fixture did not have a significant effect on customer traffic. The "reach-in" (door-type) case required 6 seconds longer to shop than the "air-curtain" case. The "multishelf" (3-deck case stocked from the front) case took the least time to shop; but the layout of the department was a factor in the low time requirements. The time requirements to shop the different cases may not be an important factor since the average sales per customer were the same for the three types of cases.

Based on labor requirements, depreciation, operating costs, and space charges, the reach-in dairy case cost \$409 less than an air-curtain installation and \$205 less than a multishelf installation.

# IMPROVED HANDLING OF DAIRY PRODUCTS IN RETAIL FOOD STORES

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## BACKGROUND OF THE STUDY

The objective of this study was to evaluate dairy handling techniques, different types of equipment, and to develop improved methods of ordering, receiving, price marking, and displaying dairy items in retail food stores.

In 1963 retail dairy sales were estimated to exceed \$4 billion.<sup>1</sup> The dairy department ranks third or fourth in sales in the retail store, and accounts for 8 to 13 percent of total store sales.<sup>2</sup>

A sales analysis of the department was made to determine what the movement was for each item and what each contributed toward total sales. Although ice cream is part of the department, it is excluded from the equipment sales analysis and the equipment cost studies because ice cream is usually displayed in a different display case, often in a different area of the store.

The overall study was conducted in a total of 13 firms; detailed observations were made in 5. In many stores, the dairy department ranked third in producing income, after the grocery and meat departments. Sales in the dairy department for 12 stores over a 6-week period averaged \$4,000 weekly, 13 percent of the average total store weekly sales. If ice cream is excluded from dairy sales, the percent of total sales would be 12 percent. Included in total dairy sales are such items as eggs, margarine, refrigerated dough products, salads, and noncarbonated drinks. These items are included because they are displayed in the dairy case and are rung up on the cash register as dairy.

Dairy ranks first in sales per man-hour (in one recent study the rate was \$183)<sup>3</sup> and reflects the small amount of processing in the department. Typically the only packaging is bulk cheese, which is usually packaged either in the meat department or at the central warehouse. The high productivity partially explains why a full-time clerk is seldom needed in the department. In the \$4,000-per-week department (average

volume), 27 hours were required to perform all labor functions (table 1).

The hours worked in a typical dairy department do not require a full-time clerk, yet it is important that there be a manager with responsibility for running the department. Without a manager, sales and productivity are often neglected. The usual procedure is to give a manager joint responsibility for dairy and another department, such as frozen food or bakery. In the store with larger dairy volume there are sufficient hours for a full-time manager-clerk. Two functions, price marking and displaying, account for 58 percent of all labor requirements in the average size dairy department.

TABLE 1.—*Time requirements for labor functions in an average retail dairy department with sales volume of \$4,000*<sup>1</sup>

Function <sup>2</sup>	Labor		Percentage of total man-hours
	Man-hours	Percent	
Ordering.....	0.8		3
Receiving <sup>3</sup> .....	4.0		15
Pricing and displaying.....	15.5		58
Price changing.....	.8		3
Policing.....	2.0		7
Cleaning dairy case.....	1.6		6
Building special displays.....	2.0		7
Miscellaneous.....	.3		1
Total.....	27.0		100

<sup>1</sup> The labor requirements for the store illustrate the proportion of time for the different function and do not represent improved operations.

<sup>2</sup> Bulk cheese was packaged and priced at the warehouse. The time spent in assisting the customer was not included because it varied so much between stores and firms.

<sup>3</sup> Includes the time for ordering merchandise from vendors.

Four categories of merchandise contribute 70 percent of the total units sold (table 2). These four items represent such a large percentage of the total units handled that any improvement in the method of handling them will help substantially in lowering the labor requirements for the department.

<sup>1</sup> Anonymous, What Customers Spent For All Products Sold in Food Stores, Food Topics 18 (9): 15 illus. September 1963. These figures are also based on other studies described in this report.

<sup>2</sup> Anonymous, A Case For The Dairy Department, Chain Store Age 38 (8): 84, illus. August 1962.

<sup>3</sup> Anonymous, Progressive Grocer Colonial Study, p. 78. New York. 1964.

Detailed analysis was made of all dairy labor requirements and time standards were established by item and by function. All production standards include a 15-percent personal and fatigue allowance, and all wage rates include 15-percent fringe benefits. Improved methods were developed, measured, and the results compared with the conventional operations. The time standards given in this report should be used as a general guide for the amount of time required for the various items or labor functions. The times stated should not be used for the establishment of labor standards, because of the differences

between firms and stores in work methods, equipment, layout, and merchandising policies.

An evaluation was made of three different types of display cases; air-curtain, reach-in (door-type), and multishelf cases. The evaluation was based on four factors: (1) Effect on sales, (2) labor requirements for stocking, (3) effect on customer flow, and (4) operating cost. Studies were made in three stores for one week to determine the effect the type of display case had on customer flow. Some of the factors that were taken into consideration were the number of items purchased, and shopping time in the department.

## RETAIL DAIRY OPERATION

The retail dairy operation was divided into four main categories: ordering, receiving, price marking, and stocking.

Studies were conducted to determine the most efficient method for each function and which combination of systems results in the best overall operation.

TABLE 2.—Average dairy sales in a \$4,000 per week dairy department for each category of items

Commodity	Sales per item	Proportion of total sales	Units sold	Proportion of total units sold
	<i>Dollars</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>
Milk.....	1,406	35	3,873	45
Butter and margarine <sup>1</sup> .....	784	20	1,276	14
Eggs.....	560	14	1,010	11
Ice cream.....	394	10	570	6
Cream.....	168	4	557	6
Bulk cheese.....	120	3	250	3
Cottage cheese.....	120	3	443	5
Process cheese loaf.....	96	2	116	1
Cookies and biscuits.....	60	2	148	2
Other items.....	292	7	585	7
Total.....	4,000	100	8,828	100

<sup>1</sup> At the time that this study was conducted in Minnesota, no colored margarine was allowed to be sold; for purposes of this study, butter and margarine sales were combined.

### Ordering

Correct ordering is the key to the success of any retail food department which handles highly perishable items. Overordering results in an increase in labor requirements for merchandise handling and rotation, a reduction in inventory turnover, and increased shrinkage. Underordering results in out-of-stock conditions and loss of sales.

To avoid overstocking or understocking the store, an order form should include a record of past sales. This is necessary because the majority

of items sell slowly and it is hard to judge the amount to order without having some knowledge of past sales (table 3). Seventy-two percent of cases ordered from the warehouse sold less than one case per week. The type of order form may vary with the particular items. Milk and cream are ordered daily, so the clerk can more readily adjust to overstocking or understocking of these than he can for butter, eggs, and ice cream which are delivered two or three times a week (usually by vendors). The stores typically receive two deliveries of dairy items per week from their warehouse.

Movement data will aid in determining which items should be discontinued because the items are not selling enough to warrant the display space. For example, a study of warehouse movement in one firm revealed that 30 of 272 items were selling extremely slowly. This represented 11 percent of the items, but only one-half of 1 percent of the total dairy sales. There were a number of other items that were borderline cases.

TABLE 3.—Movement per week by cases in a \$4,000 per week dairy department delivered from the warehouse and from vendors

Number of cases sold per week for any one item	Warehouse shipments	Vendor shipments
	<i>Percent</i>	<i>Percent</i>
Less than one.....	72	39
Between one and two.....	18	21
Between three and five.....	6	14
Over five.....	4	26

A good ordering form (fig. 1) has a column to post the average number of cases sold for the previous 10 orders. The order form is marked off so there are 10 columns for each line. There are two reasons why the ordering form was limited to 10 orders: (1) When figuring the average case sales per order, it is easier for the clerk to divide by 10 than by any other number, and (2) the size of the order sheet becomes unwieldy with more columns.

## Card order form

Line number	Code	Pack size	Description	Retail price	Ave. move- ment/ order <sup>1</sup>	1	2	3	4	5	6	7	8	9	10
1	35-2400	30/1#----	Oleomargarine Brand X Margarine-----	.25	4	4	5	3	6	4	/	/	/	/	1
2	35-2401	30/1#----	Brand Y Margarine-----	.31	1½	1	2	1	3	1	/	/	/	/	2
3	35-2402	32/1#----	Brand Z Margarine-----	.27	2½	2	3	1	4	4	/	/	/	/	3
4	35-2403	30/1#----	Brand A Margarine-----	2/59	2½	3	3	2	2	3	/	/	/	/	4
5			Butter								/	/	/	/	5
6	35-2500	8/2#----	Brand A Tuh Butter----	\$1.45	1	1	1	2	1	1	/	/	/	/	6
7	35-2501	32/1#----	Brand B Butter-----	.67	5½	6	3	1	2	4	3	/	/	/	7
8	35-2502	32/1#----	Brand C Butter-----	.70	3	2	1	3	1	4	2	/	/	/	8
9	35-2503	32/1#----	Brand D Butter-----	.65	1	1	1	—	1	0	1	/	/	/	9
10			Grated Cheese								/	/	/	/	10
11	35-2600	12/2 oz.--	X Grated American-----	.17	—	1	0	0	1	0	/	/	/	/	11
12	35-2601	12/3 oz.--	Y Grated Parnesan-----	.39	¼	0	0	1	0	1	/	/	/	/	12
13	35-2602	12/1½ oz.--	Y Grated Parnesan-----	.23	¼	1	0	0	0	0	/	/	/	/	13
14	35-2603	12/2½ oz.--	Y Shredded Parnesan--	.37	¼	0	1	0	1	0	/	/	/	/	14
15											/	/	/	/	15
16	35-2700		Brand X-----	-----	12	12	12	12	12	12	/	/	/	/	16
17	35-2701		Brand Y-----	-----	2	1	1	3	1	3	/	/	/	/	17
18											/	/	/	/	18
19											/	/	/	/	19
20											/	/	/	/	20

<sup>1</sup> Average case sales is derived by adding the past 10 orders and dividing the total by 10.<sup>2</sup> The mark-sense card is lined up with the order form so one can follow the line after posting the order to the same line on the mark-sense card.

Figure 1.—Dairy department order form and sales guide with a record of the average order for the past 10 weeks.

Mark—Sense Card <sup>2</sup>

Mark in this column Qualities of 10 or more (only one mark per item)			
1	—	—	1 2 3 4 5 6 7 8 9
2	—	—	1 2 3 4 5 6 7 8 9
3	—	—	1 2 3 4 5 6 7 8
4	—	—	1 2 3 4 5 6 7 8
5	—	—	1 2 3 4 5 6
6	—	—	1 2 3 4 5
7	—	—	1 2 3 4
8	—	—	1 2 3
9	—	—	1 2
10	—	—	1
11	—	—	
12	—	—	
13	—	—	
14	—	—	
15	—	—	
16	—	—	1 2
17	—	—	
18	—	—	
19	—	—	
20	—	—	

Each of the 10 ordering columns should have its order space divided by a diagonal line. In the upper left hand corner the backroom inventory is written. This figure is referred to when the clerk checks on what merchandise is on display. After mentally totaling the two figures he checks the average movement for the previous ten week period and then posts in the lower right hand corner the amount to be ordered (received).

Large firms which have automatic data processing equipment can use mark-sense cards in conjunction with their ordering form (fig. 1). This system is referred to as the "card order plan" and the cards as "mark-sense cards," since they are marked with a special pencil which permits warehouses to process them automatically. After the order is finished, the cards are sent to the warehouse for processing. A new pack of mark-sense cards is used for each order. Advertised specials, special promotions, holidays, and price changes should be noted when posting the ordering book.

Stores should have a special order form for eggs in order to know the daily turnover. Figure 2 shows a form which can be used for a firm that orders eggs daily.

Suggestions for a retail dairy order form are on page 10.

### Receiving

Most retail dairy departments receive merchandise from the central warehouse and also direct from several vendors. The time to receive dairy products depends on the number of deliveries; capacity of the display case, cooler, and freezer; and the leeway the vendor has to replenish the stock.

In 1 department with a volume of \$4,000 per week the 18 deliveries per week from vendors required 3.8 hours for receiving. Savings could be obtained by cutting down on the number of vendors and cutting down on the frequency of deliveries.

Deliveries required the time of the clerk while they were being made (table 4). If the clerk does not keep a surveillance, there is the probability of increased pilferage, overstocking, or an undesirable increase in spread of merchandise on display. There is also the probable loss of time due to the clerk visiting with each vendor.

As previously mentioned, dairy departments usually receive two deliveries per week from the warehouse. Receiving on pallets is the most efficient method for retail stores with docks because the vast majority of items can be taken directly to the display floor and stocked.

If the store does not have a dock, then either a semilive skid or a six-wheel handtruck should be used for receiving. In a department with a weekly sales volume of \$4,000 and two warehouse deliveries, receiving on pallets required 30 percent less time than receiving with six-wheel handtrucks (table 13). The number of cases required per week in a department of this size was 130,

TABLE 4.—*Analysis of time for receiving commodities from vendors for a dairy department with \$4,000 per week sales*

Commodity	Deliveries per week	Time per delivery <sup>1</sup>	Time per week
	<i>Number</i>	<i>Minutes</i>	<i>Hours</i>
Milk-----	6	14	1.4
Eggs-----	3	10	.5
Butter-----	2	9	.3
Ice cream-----	2	17	.6
Miscellaneous items-----	5	12	1.0
Total time-----	-----	-----	3.8

<sup>1</sup> Includes a 15-percent personal and fatigue allowance.

an average of 65 cases per delivery. The total time for receiving merchandise from both the vendors and the central warehouse is 4 hours per week (tables 4 and 13).

Suggestions for receiving dairy merchandise efficiently at the retail store are on page 11.

### Price Marking

The handling of most dairy items is similar to the handling of grocery items in that the only change in the package or container is the addition of the price. This function may be performed by the distributor, the vendor salesman, the dairy clerk, or the container may not have a price stamped on it. In some stores individual units of fast selling brands of half-gallon milk are not price marked and the cashier remembers the price. This one item accounted for 33 percent of the total dairy units sold in the stores studied, and the elimination of price marking materially reduced the labor requirements for this function.<sup>4</sup> A store having weekly dairy sales of \$4,000 will sell approximately 8,800 units per week. Sixty-four percent of the 8,800 units sold in such a department have to have the price stamped on the item. The other 36 percent of the items are either prepriced, weighed and priced, or the price is posted at the checkout stand.

The in-store price marking is typically performed in conjunction with stocking, and the majority of stores use an adjustable band stamp. Previous Agricultural Marketing Service research on price marking in the grocery and frozen food departments determined that using the porous, self-inking stick stamp (held in a base with a reservoir of ink) was the most efficient method of stamping the price on the merchandise.<sup>5</sup>

<sup>4</sup> If priced, in a dairy department with sales of \$4,000 per week, it would require 48 minutes a week.

<sup>5</sup> "Handling Groceries From Warehouse to Retail Store Shelves," by Paul Shaffer, John C. Bouma, James J. Karitas, and Gordon Flynn, U.S. Department of Agriculture Marketing Research Report No. 473, 47 pp., illus. May 1961.

Item and date		Monday			Tuesday			Wednesday			Thursday			Friday			Saturday		
		Inv.	Rec.	Sold	Inv.	Rec.	Sold	Inv.	Rec.	Sold	Inv.	Rec.	Sold	Inv.	Rec.	Sold	Inv.	Rec.	Sold
Jumbo	Jan. 5	3	5	4	4	3	4	3	6	6	3	4	5						
	12	1	5	4	2														
	19																		
	26																		
Large	5	8	17	20	5	20	20	5	25	24									
	12	4	22	22	4														
	19																		
	26																		
Medium	5	7	18	18	7	15	16												
	12																		
	19																		
	26																		
Small	5	3	—	2															
	12	1	1	0															
	19																		
	26																		

Figure 2.—Special ordering guide for cases of eggs.

The stick stamp seemed especially adaptable to dairy items because of its small surface area. Some of the packages are soft—for example, cream cheese—and if too much pressure is applied, the package is forced out of shape. A stick stamp requires only a slight amount of pressure to stamp the price.

An analysis of dairy prices over a period of weeks showed that a set with 38 stamps would price 95 percent of all items (appendix table 14). If stick stamps were provided for the remaining 5 percent, the stamp set would become too large for mounting on a stock truck, and the time to select and put away the stamps would increase with the number of stamps. The self-inking adjustable band stamps are flexible and can be used in conjunction with the stick stamp set to price the remaining 5 percent of the units. In a department with \$4,000 weekly sales, the labor savings through use of the stick type stamp set (in conjunction with the band stamp) as compared with using only a band stamp would be .117 minutes per average case (appendix table 15). With a labor saving of .56 cents per case, a store with 554 cases to price per week, would realize a yearly saving of \$162. There is no significant difference in the cost for the pricing equipment of either system.

A new type of base now on the market has thimbles which can be removed from the base holes, so that the holes can accommodate either a single-price stamp or a multiprice stamp. This gives the flexibility of having any combination of single or multiprice stamps one wants without buying a new base. The base is made so the stamps rest directly on an inked reservoir pad inside the base. This base provides fully inked stamps at all times resulting in better and faster price marking. It also keeps the porous tips soft and pliable and, therefore, gives longer stamp life.

One store placed a piece of yellow tape around each stick stamp to distinguish the dairy from the grocery stamps and to enforce the rule that no one may take the stamp from the set except the dairy clerks.

Some suggestions for obtaining an efficient price marking operation are on page 11.

### Stocking

The stocking of dairy items accounts for 51 percent of the labor in the department. This includes the travel to and from storage, rotation, policing the case, and handling empty containers. The regular dairy clerk will do most of the stocking, but in many cases a part-time clerk or a driver-salesman will do some stocking. The time requirements depend on equipment, type of display case, layout, work methods, and merchandising policies.

### *Transportation to the Display Area*

The most efficient means of transporting dairy items to the display cases is on pallets, providing they are received on pallets. Dairy items are often received and temporarily stored in the cooler and then transported to the display area by a two-wheel or four-wheel stock truck. A better method is to use a six-wheel stock truck which has two center wheels for easy turning, a shelf for price-marking equipment, and a rack for collapsed cardboard containers.

The two-wheel handtruck has an average capacity of 5.6 cases, compared to 16.0 cases for the six-wheel truck. The time to transport 100 cases to the display case and return to storage is 23 minutes for the two-wheeler and 10 minutes for the six-wheeler.

If the store has a dock and the merchandise is shipped on a pallet, it will take approximately 8 minutes per week to transport the warehouse-shipped merchandise (130 cases) from the backroom to the display floor.

### *Comparison of Stocking Methods*

When stocking, the handtruck should be next to the display case, the master container should be close to the body of the handler (preferably between the clerk and the location of the merchandise being stocked), and at least one unit in each hand should be placed on the shelf simultaneously. Studies were made on the time requirements between two methods of stocking. One method was to stock from a carton which is sitting on a handtruck with the units being passed from hand to hand. This method required 1.65 minutes per case. (The average number of units per case was 10.1.) When the carton is placed on top of other merchandise on display and two units are obtained and positioned in the display case with each hand simultaneously the time per case with the method observed is 1.29 minutes (fig. 3).

The type of item has an effect on labor requirements for stocking. Ice cream takes almost four times as much time to price and stock as half gallons of milk (table 5). The miscellaneous dairy items which represent 15 percent of all units sold accounted for 23 percent of the man-hour requirements.

The merchandising policies of the firm will, in part, determine labor requirements for stocking. As a firm carries more items on its order form, it probably will have more slow movers, and more labor for stocking. If the policy is to maintain full displays, stocking time will increase. When the firm insists on frequent rotation, labor increases. Frequent stocking during peak sales periods adds to labor cost. Improved techniques for stocking, developed in this study, are on page 11.

A modification of the rear-fed air curtain display case illustrates the application of the principles of dairy stocking. This case like the "air curtain case" is a rear-fed case in combination with



Figure 3.—Clerk stocking a conventional multiself display case.

BN-21953

the storage cooler. The items are placed on the rear portion of one of the several belts. The belt is activated when the customer buys the last item from the front row on that belt. The belt then carries the merchandise on to a small plate at the front of the display which activates a solenoid switch and stops the belt.

This display case insures: (1) Maximum rotation, (2) displays which always appear full to the customer, (3) low stocking labor requirements, (4) a minimum of traveling and customer interference, (5) little policing or rearranging of display. Its disadvantages are: (1) Cost of the equipment and installation is high; (2) maintenance cost is high; and (3) there is loss of display space between belts.

## Suggestions for Retail Dairy Department

### Order Form

1. The order form should have those features which permit it to be incorporated into other store records.

2. Information on past orders should be recorded so the order form can be used as a guide in ordering.

3. There should be a code for noting advertised specials, special promotions, holidays, and price changes.

4. The order form should be limited to 10 orders to simplify the computation of the average sales.

TABLE 5.—*Labor requirements for pricing and stocking a conventional multishelf display case in a dairy department with a sales volume of \$4,000 per week*

Commodity	Units sold per week	Time to price	Time to stock <sup>1</sup>	Total time per unit to price and stock	Total time	Proportion of total man-hours
	<i>Number</i>	<i>Minutes</i> <sup>2</sup>	<i>Minutes</i> <sup>2</sup>	<i>Minutes</i>	<i>Hours</i>	<i>Percent</i>
One-half gallon milk.....	2, 883	( <sup>3</sup> ) . 067	. 067	. 067	3. 2	21
One-half gallon milk.....	728	. 017	. 067	. 084	1. 0	6
Quarts milk.....	262	. 023	. 070	. 093	. 4	3
Cream.....	557	. 021	. 064	. 085	. 8	5
Butter and margarine.....	1, 276	. 012	. 074	. 086	1. 8	12
Eggs.....	1, 010	. 014	. 103	. 117	2. 0	13
Bulk cheese.....	250	( <sup>4</sup> ) . 048	. 048	. 048	. 2	1
Ice cream.....	570	. 046	. 212	. 258	2. 5	16
Misc. items <sup>5</sup> .....	1, 292	. 037	. 128	. 165	3. 6	23
Total units.....	8, 828					100
Total man-hours.....					<sup>6</sup> 15. 5	

<sup>1</sup> The time includes the travel, rearranging and rotation, disposing of empty containers and other miscellaneous elements.

<sup>2</sup> Includes 15 percent personal and fatigue allowance.

<sup>3</sup> Price was not stamped on the carton, but was posted at the checkout stand.

<sup>4</sup> Priced at the warehouse.

<sup>5</sup> For additional details see appendix table 16.

<sup>6</sup> The time stated reflects the use of adjustable band stamp for pricing, and two- and four-wheel hand trucks for transporting the merchandise to the display case.

## Receiving

1. Consolidate old merchandise in cooler prior to receiving.

2. Segregate like (similar) merchandise.

3. Date-code merchandise that won't go on display the day it is delivered.

4. Spot-check the condition of merchandise received.

5. Make at least a piece count of merchandise received from the warehouse.

6. Make a commodity check on items received from vendors.

7. Check display case before the order is delivered to determine what merchandise can be stocked right away.

8. Provide an area in the cooler for temporarily holding outdated or damaged merchandise.

9. Have shelves in the cooler to utilize all the storage space available and to cut down on the rehandling cost.

10. Keep the cooler aisle, next to the rear-fed display case, clear of stored merchandise.

11. Always follow the policy of first-in, first-out when displaying.

## Price Marking

1. Mark price legibly. Illegible prices occurred on 5 percent of the customer orders at the checkout counter, thus forcing the checker to stop recording sales in order to ask or send someone for the correct price.

2. Don't have too many items without a price on them, because it will overtax the checker's memory and thus slow down the checkout.

3. Have the stamp set mounted on the stock truck.

4. When pricing, stamp the units in an "s" pattern in order to establish a rhythm and avoid excessive changes in direction.

## Stocking

1. The clerk should check the entire display case and make a list of merchandise needs before going to the storage cooler.

2. The receiving of merchandise should be combined with the bringing of the merchandise to the display case.

3. Six-wheel "low-boy" handtrucks should be used for transporting merchandise because of their capacity and maneuverability.

4. A self-inking stamp set should be mounted on the handle of the handtruck.

5. Emphasis should be placed on good rotation of the merchandise; however, it can be overdone by rotating merchandise with the same expiration date.

6. When stocking, the handtruck should be next to the display case, the master container should be close to the body of the handler, preferably between the clerk and the location of the merchandise being stocked, and at least one unit in each hand should be placed on the shelf simultaneously.

7. The empty cartons should be nested or collapsed and placed on the stock truck.

8. Get rid of empty containers and trash as they accumulate.

9. If the clerk is called up front to help at the

checkout counter, he should first wheel the stock truck into the cooler.

10. When possible, stock during slack sales

## HANDLING EGGS IN THE DAIRY DEPARTMENT

Eggs are usually received at the retail store in fiberboard containers, each holding thirty 1-dozen cartons. Two-wheel stock trucks are used to move egg containers into the cooler for temporary storage and then out to the display area for stocking. The first step in stocking is to rotate the cartons by either pulling them forward or setting them aside. The clerk then price-marks the new merchandise with an adjustable band stamp. A row of six cartons is stamped, the stamp is set aside, and the six units are placed on display. This is repeated for the four remaining layers in the container. The empty container is collapsed and set aside. When the display is reasonably full the containers that have been set aside for rotation are placed on top.

Eggs represent approximately 11 percent of all units of merchandise sold in the dairy department. They are highly perishable, and it is difficult to maintain full displays during peak periods. Studies were made to determine the labor and material cost for the typical method of handling eggs. A new system for handling eggs in the retail store was developed.

The fiberboard container was replaced by a collapsible wire container, which can be placed directly in the display case (figure 4). The wire containers will stack double. It is filled at the packing plant and the cartons aren't handled individually until selected by the customer. When ready for stocking, the cartons are price marked on their side with a stick stamp.<sup>6</sup>

The wire containers are positioned in the display case two deep (one behind the other) (fig. 4). When the container in the front row gets low the empty or nearly empty container is removed; and the full containers in the rear are pulled forward. Cartons remaining in the containers which were removed from the display case are placed on top of the displayed merchandise. Wire baskets insure easy rotation of the eggs because the nearly empty wire baskets must be removed from the display case in order to position the full case. The collapsed containers are placed on the stocking truck and transported to the storeroom. The use of wire baskets for handling eggs represents a labor savings of .054 minute per carton (appendix table 17).

<sup>6</sup> If pricing on the side of the carton is objectionable the price could be stamped automatically on the top of the carton as it is being assembled at the packing plant.

periods to minimize interference with customers.

11. Keep merchandise displays at a reasonable height.

The wire baskets have a higher initial cost than fiber containers, but their longer life expectancy results in a lower container cost. The fiber containers will, on the average, make 4½ round trips, compared to approximately 150 trips for the wire containers. The containers make one round trip per week. The wire containers cost .1 cent per carton compared to .18 cent for fiberboard containers (appendix table 18).

When labor and material costs are combined the wire container will produce a saving of \$3.40 per 1,000 cartons (table 6).

TABLE 6.—Comparative labor and material cost per 1,000 cartons handled in fiberboard and wire containers for eggs

Cost factors	Fiber-board case	Wire case	Savings
	Dollars	Dollars	Dollars
Labor <sup>1</sup> -----	5.62	3.02	2.60
Material-----	1.80	1.00	.80
Total-----	7.42	4.02	3.40

<sup>1</sup> Labor costs were based on \$2.50 per hour plus 15-percent fringe benefits for a total of \$2.88 per hour.

In addition to these very tangible benefits, there are several other advantages to the wire containers: (1) It is easier to maintain full displays during peak periods, (2) breakage is reduced because individual cartons are not handled, (3) shrinkage is reduced because of the improved method of rotation, and (4) there are additional savings at the packer level.

The potential savings for a store or firm can be determined from appendix table 19. A rule of thumb used to determine the volume of eggs sold in a given store is 35 cartons (dozen eggs) for every \$1,000 of total store sales.

Some suggestions for handling eggs at the retail store are: (1) Keep records of past sales for use as an ordering guide; (2) a rotation policy of first-in, first-out, should be followed; and (3) have a place set aside on a shelf in the cooler for temporarily storing broken eggs.



Wire egg cases on display

BN-21958



Price-marking with stick stamp

BN-21961



Positioning full wire container into the display case

BN-21957



Collapsing an empty wire basket

BN-21959

FIGURE 4.—Using wire baskets for stocking eggs.

# EVALUATION OF THREE TYPES OF DISPLAY CASES

Three different types of display cases were evaluated to determine which case or combination of cases was the most economical. The three cases were: Multishelf, rear-fed with air curtain, rear-fed with doors in the sales area (fig. 5). The multishelf case had three refrigerated shelves and one unrefrigerated shelf, with a storage cooler located in the backroom near the display cases. The air-curtain case combines the display case with the storage cooler. There are sliding doors at the rear of the case which separate the case from the cooler. The front of the case has a directed airflow or air curtain to confine the refrigerated air. The reach-in or door-type case is the same as the air curtain except that it uses glass doors at the front of the case and does not have the sliding doors at the rear of the case. Four factors were taken into consideration in the evaluation: (1) Overall equipment cost (which included equipment, operating cost, floor space, and shelving comparison), (2) labor requirements, (3) effect on sales, and (4) effect on customer shopping patterns

In the 12 stores studied, the average sales per linear foot were \$110. At this rate, a \$4,000 dairy department would require approximately 36 linear feet of display case

The stores in which the multishelf case was evaluated had 36 feet of display case. The stores with the rear-fed air-curtain case in combination with a multishelf case had a 12-foot (opening) air-curtain case and a 24-foot multishelf case. The stores with the door-type (reach-in) case in combination with a multishelf case had a 12-foot (opening) door-type case and a 24-foot multishelf case (fig. 6).

## Operating Costs

The operating and equipment costs and the charge for delivering and installing the equipment vary from store to store and area to area. Each firm can insert its own cost factors into the tables and derive that combination of display cases which will maximize their profits.

## Initial Cost and Installation

The comparison of equipment cost showed that the multishelf installation cost \$69 less than the reach-in installation and \$129 less than the air curtain (table 7).

## Utilities Cost

The following tabulation shows the electrical power cost per year for three different combinations of display cases based on the records of one firm. The operating costs were based on the store being open 16 hours per day, and included all lights, heaters, and fan motors. The cost of the electricity was based on 2.5 cents per kilowatt hour.

	Dollars
Layout #1 (multishelf) .....	1,602
Layout #2 (reach-in door) .....	1,539
Layout #3 (air curtain) .....	1,888

The most economical case was the reach-in case and the most expensive was the air-curtain case. The yearly difference in operating cost between the reach-in and the multishelf and air curtain layouts was \$63 and \$349 respectively.

TABLE 7.—Equipment costs for three different combinations of display cases <sup>1</sup>

Type of equipment	Layout #1	Layout #2	Layout #3
	Dollars	Dollars	Dollars
Multishelf (3-tier) .....	3,162	2,108	2,108
Storage cooler 10' by 10' <sup>2</sup> .....	840		
Air curtain (with storage area) 10' by 14' with a 12' opening .....		2,559	
Reach-in with doors and storage area 10' by 14' with 12' opening .....			3,154
Total equipment cost .....	4,002	4,667	5,262
Depreciation at 10 years .....	400	467	526
Interest on invested capital of 5 percent <sup>3</sup> .....	100	117	132
Total cost per year .....	500	584	658

<sup>1</sup> Cost included condensing unit, blower coils, delivery, installation, and warranties.

<sup>2</sup> All three installations had a 10' by 10' cooler. The storage cooler is included in the overall dimensions of the air-curtain and reach-in case.

<sup>3</sup> Interest is paid on half the life of the equipment.

## Floor Space and Storage Cost

A comparison was made of the floor space requirements for both the display cases and storage coolers. Although there was a negligible difference in space requirements for the three types of dairy case installations, it is important that the operator recognize that space charges might conceivably be a significant cost factor:

	Square footage
Multishelf case and storage cooler .....	226
Combination air-curtain and multishelf case .....	224
Combination reach-in and multishelf .....	224

When different types or combinations of equipment are used, charges for space may to a greater extent determine the choice of equipment. In one firm where this study was conducted, they had a space charge of \$7.05 per square foot per year.

The reach-in layout had 15 percent more square footage of shelving than the multishelf and 5 percent more than the air curtain. When the combined square footage of display shelving and storage space are compared, the reach-in layout has 9 percent more square footage than the multishelf and 3 percent more than the air curtain (table 8). All three installations had the same amount of linear footage of display (36 feet).



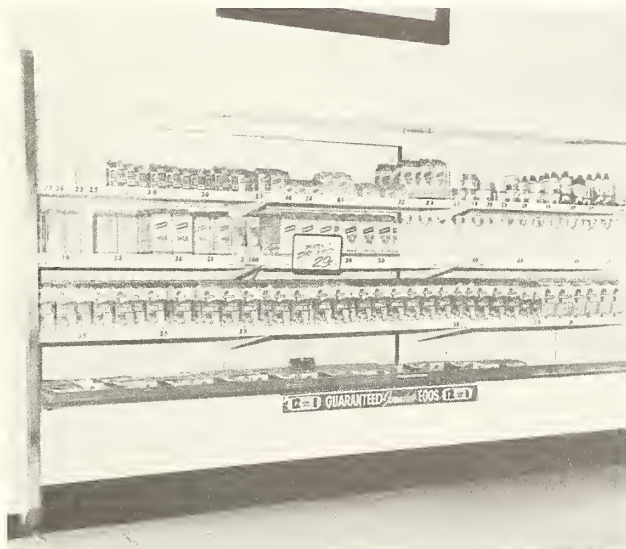
Multishelf

BN-21960



Reach-in (door type)

BN-21955



Air curtain

BN-21954

FIGURE 5.—Three types of display cases which were studied.

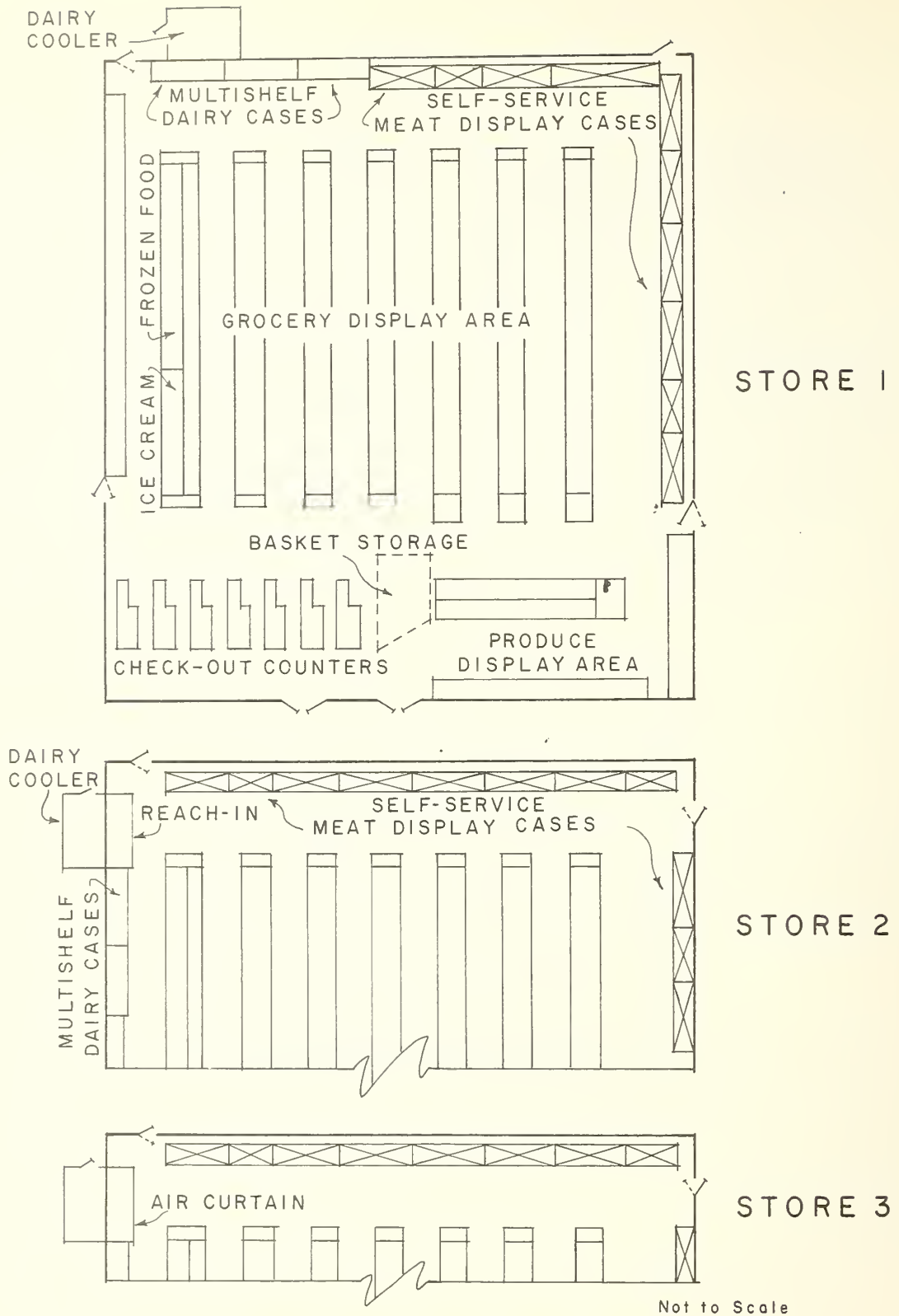


FIGURE 6.—Store layouts for 1, 2, and 3 stores.

TABLE 8.—Comparison of square footage of display shelving and storage cooler space for the three combinations of display equipment studied

Equipment	Display shelving	Cooler space <sup>1</sup>	Total space
	Sq. ft.	Sq. ft.	Sq. ft.
Three 12' multishelf cases and 10' by 10' cooler -----	167	100	267
Two 12' multishelf cases and 10' by 14' air curtain -----	187	98	285
Two 12' multishelf cases and 10' by 14' reach-in -----	197	98	295

<sup>1</sup> Aisle space was included in the total.

### Labor Requirements

The air-curtain and the door-type cases are both attached to the cooler so that the clerk can stand in the cooler and stock merchandise from the rear of the display case; the multishelf case has to be stocked from the front.

The air-curtain and the door-type cases required the least labor for stocking—17 percent less than the conventional multishelf case. This represents a saving of \$180 per year (table 9).

The labor savings are due to reduced travel, the comparative ease of placing the items on the shelf, easier and more effective rotation, and no customer interference during peak stocking periods (fig. 7). These advantages are lost in some stores because the clerk does not want to remain in the refrigerated cooler for long periods, and therefore stocks from the front of the case.

### Overall Cost Comparison

When the four cost factors (equipment, operating cost, cost for the extra floor space, and labor)



FIGURE 7.—Clerk stocking a rear-fed display case.

are combined, the reach-in installation is \$275 less than the air curtain and \$100 less than the multishelf layout (table 10). The relatively high loss of refrigerated air in the air-curtain case results in the highest operating cost. The multishelf case is more difficult to stock and therefore has higher labor costs. The only area where the reach-in case has the highest cost is the initial investment and installation.

TABLE 9.—Comparative labor requirements for stocking three types of display cases in a dairy department with \$4,000 per week sales <sup>1</sup>

Commodity	Proportion of total units sold	Time per unit to stock when display case is—	
		3-tier	Rear-fed <sup>2</sup>
Milk:	Percent	Minutes	Minutes
½ Gallon -----	42	.067	.054
Quarts -----	3	.076	.060
Cream:			
Pints -----	4	.070	.054
½ Pints -----	2	.059	.044
Butter -----	7	.078	.068
Eggs -----	11	.101	.091
Weighted average -----	69	.074	.061
Hours per week <sup>3</sup> -----		7.5	6.2
Cost per year <sup>4</sup> -----		\$1,917	\$1,737

<sup>1</sup> The comparison is for those items which are typically stocked in either the air-curtain of the door-type case.

<sup>2</sup> Same time for air-curtain and door-type cases.

<sup>3</sup> Based on 6,078 units per week.

<sup>4</sup> For an average wage of \$2.88 (includes fringe benefits).

TABLE 10.—Comparison of equipment, labor requirements, operating, and floor space cost for the three installations <sup>1</sup>

Cost factors	Multi-shelf	Reach-in combination	Air-curtain combination
	Dollars	Dollars	Dollars
Equipment and installation <sup>2</sup> -----	500	658	584
Utilities <sup>3</sup> -----	1,602	1,539	1,888
Floor space <sup>4</sup> -----	1,594	1,579	1,579
Labor requirements <sup>5</sup> -----	1,917	1,737	1,737
Total -----	5,613	5,513	5,788

<sup>1</sup> Maintenance costs were not included in the study.

<sup>2</sup> Table 7.

<sup>3</sup> Costs were based on a 16-hour day at .025 cent per kilowatt hour.

<sup>4</sup> Yearly floor space charge of \$7.05 per square foot.

<sup>5</sup> Tables 2 and 9.

### Effect of Display Case on Sales

Retailers are faced with claims that a particular display case will sell more dairy items. In some retail organizations they have all three types or

combinations of the three cases observed in this study. An analysis was made of dairy products sold from different display fixtures to determine whether the display case had any effect on sales.

A study was conducted in 12 stores of 2 firms over a 6-week period to determine whether the type of case had any effect on sales or customer shopping habits and patterns. In one firm there were three stores with the multishelf case and three with the rear-fed case with doors. In the other firm there were three stores with the multishelf case and three with the rear-fed, air-curtain case. All stores were in a metropolitan area, they carried the same major items, and had comparable merchandising policies.

A month before the test period, the high-volume items were rearranged in all 12 stores so they would have the same basic arrangement. Complete similarity was impossible because of the structural differences of the three types of display cases. All 12 stores had at least one section of multishelf conventional display cases. During the test period, the egg display was at the extreme end of the multishelf case for all 12 stores. Ice cream was excluded from the study because it was displayed in a separate case. The major items displayed in the air curtain and door type cases were milk, cream, and butter. In the 12 stores, these 3 items accounted for 53 percent of total dairy sales (table 2). If eggs, which were displayed in the same type of fixture and location in each store, are included in the total, the four items would represent 73 percent of total dairy sales (table 2).

Dairy sales per customer were adjusted to reflect differences in total store sales per customer between stores. There were considerable differences in total sales per customer among the six stores in each firm. Dairy sales per customer was only a minor factor contributing to the differences. To weight out all other factors, total store sales per customer (less dairy sales per customer) for the six stores in each firm were averaged and an index number was obtained for each of the stores. This index was then applied to dairy sales per customer for each of the six stores in each firm. This to a large part removed from dairy sales the factors which caused differences among stores in sales per customer. The study revealed that at the 95-percent confidence level the slight differences in sales of items that were predominantly displayed in the reach-in and air-curtain cases (milk, cream, and butter) were not statistically significant (table 11). A larger sample and better controls might show that the type or combination of equipment does have some effect on sales.

#### Effect of Display Cases on Shopping Time and Purchases

Customer patterns were collected for each of the three types of display cases evaluated to determine what effect the type of display case has on the

TABLE 11.—Comparison of the effect that three types of dairy display cases had on overall dairy sales and on selected dairy items<sup>1</sup>

Firm, type of case and stores	Average dairy sales per customer <sup>2</sup>	Proportion milk, cream, butter sales is to total dairy sales <sup>3</sup>	Sales of milk, cream, and butter per customer <sup>2</sup>
Firm A:			
Multishelf case—	<i>Cents</i>	<i>Percent</i>	<i>Cents</i>
Store #1-----	.60	66.5	.40
Store #2-----	.60	61.3	.42
Store #3-----	.62	66.1	.41
Average-----	.61	64.6	.41
Door type case—			
Store #1-----	.61	67.4	.41
Store #2-----	.77	69.4	.53
Store #3-----	.52	63.7	.33
Average-----	.63	66.8	.42
Firm B:			
Multishelf case—			
Store #1-----	.78	63.2	.49
Store #2-----	.81	63.1	.51
Store #3-----	.70	57.4	.41
Average-----	.76	61.2	.47
Air curtain case—			
Store #1-----	.78	64.7	.51
Store #2-----	.61	61.4	.38
Store #3-----	.80	60.5	.48
Average-----	.73	62.2	.46
Grand average---	-----	63.7	-----

<sup>1</sup> For a more detailed analysis, see appendix table 20.

<sup>2</sup> Adjusted for differences in customer shopping habits between stores.

<sup>3</sup> Margarine was not included in this analysis because it was displayed in a multishelf case in all stores.

number of items purchased, shopping time in the department, and traffic flow.

Each day was divided into 30-minute periods and records were obtained during four periods per store each day. The test periods were staggered over the 6-day week so that each portion of store hours (9 a.m. to 9 p.m.) was covered at some time during the week. An observer with a plot sheet and a stop watch would select customers at random when they entered the department area without calling attention to the study and would observe the customers as long as they remained in the dairy department. The plot sheet had a layout of the department and a listing of the information to be recorded (appendix fig. 8). With colored pencils the observer could plot and record the information for several customers on one sheet, thus speeding up the collection and consolidation of the data.

In addition to the plots by the observer, a 16-mm. motion picture camera with electric-motor drive was used during peak sales periods.

The camera recorded all shoppers, but with less detail than the observer method. During the week, 1,360 dairy customers were observed, which was 7.4 percent of all customers who shopped in the three stores where the study was made.

It should be emphasized that there was a great similarity between the equipment in the three types of stores. Of the 36 feet of display cases, 24 feet were multishelf in both the air-curtain and reach-in installations. One therefore would not expect dramatic effect on customer flow or sales. Although on the average 65 percent of the dairy items were sold in 12 of the 36 feet of space in both the air-curtain and the reach-in cases, these are normally classified as demand items and conceivably could sell equally well in either case.

It took 6 seconds longer to shop the reach-in case than it did the air-curtain case (table 12). The multishelf case only took 40 seconds to shop; however, the layout of the department was a contributing factor for the low time requirement.

The difference in the amount of time to shop, and in the number of units sold per customer for the different types of cases may not be an important consideration since there was not a statis-

tically significant difference in the total dollar sales per customer among the cases.

TABLE 12.—*Effect the type of display case has on the amount of time it takes to shop and the number of items purchased.*

Type of display equipment	Shopping time <sup>1</sup>	Units purchased <sup>2</sup>
	<i>Seconds</i>	<i>Number <sup>4</sup></i>
Multishelf.....	<sup>3</sup> 40	1.4
Reach-in (door type).....	65	1.4
Air curtain.....	59	1.8

<sup>1</sup> The average time was 54 seconds and ranged from 39 seconds for males to 98 seconds for couples.

<sup>2</sup> This varied from 1.3 for male shoppers to 2.3 units for couples.

<sup>3</sup> The reason for the low time may be in part explained by the layout of the department. The grocery gondolas were at right angles to the dairy case which was along the rear wall of the store. This allowed the customer to leave the department once she had purchased the demand items and those items on the shopping list.

<sup>4</sup> Even though there was a difference in the amount of sale units sold per case the total dollar sales per customer was the same for the three display cases (table 11).

## DAIRY DEPARTMENT LAYOUT AND MERCHANDISE ARRANGEMENTS

Locate the dairy department so as to pull traffic through the store. The department has so many demand items, such as milk, butter and eggs, that the average customer purchases 1.5 units per visit. If dairy is located towards the rear or the far perimeter of the store, the customer will be exposed to more merchandise, thus possibly increasing sales in other departments of the store.

Design the department so traffic moves in one direction. Two-way traffic leads to congestion.

Layout of the dairy department should avoid exits, to encourage complete shopping. This encourages the customer to travel the full length of the display case, thus increasing the probability of impulse sales.<sup>7</sup> It also eliminates congestion caused by customers leaving their shopping carts at the end of the grocery gondola or in the grocery aisle and walking over to purchase an item in the dairy case.

Use specials to pull customers into corners and "dead" sales areas. Such items as milk, butter, and eggs have considerable "pull" and their strategic placement within the department will increase customer exposure to other dairy items.

Ice cream should be located near the checkout counter. This will reduce the problem of having the ice cream being partially melted before the customer gets it home.

Stores with only multishelf display cases should have their storage cooler located near the display case, and milk should be displayed in the case closest to the storage cooler. This will lower labor requirements by cutting the distance traveled while stocking.

<sup>7</sup> Havas, Nick and Smith, Hugh. Customer Shopping Patterns in Retail Food Stores—An Exploratory Study. U.S. Agr. Mktg. Serv. AMS-400 3 pp. August 1960.

# APPENDIX

TABLE 13.—*Comparison of time requirements for receiving dairy merchandise at retail store by pallets and six-wheel handtrucks (average delivery was 65 cases)*

Element	Pallet			Handtruck		
	Standard time	Frequency of occurrence	Weighted time	Standard time	Frequency of occurrence	Weighted time
	<i>Min.</i>	<i>Percent</i>	<i>Min.</i>	<i>Min.</i>	<i>Percent</i>	<i>Min.</i>
Obtain pallet jack and return.....	.485	1.5	.007	.285	1.5	.004
Obtain six-wheel handtruck.....	.100	1.5	.002	.043	100.0	.043
Engage pallet jack.....	1.500	1.5	.022	1.100	1.5	.016
Load handtruck.....	.512	1.5	.008	.484	1.5	.007
Check merchandise delivered <sup>1</sup> .....	.650	1.5	.010	.505	1.5	.008
Travel to cooler.....				.270	1.5	.004
Unload merchandise <sup>2</sup> .....	.320	1.5	.005			
Dispose of handtruck.....	.179	1.5	.003			
Dispose of pallet.....						
Dispose of pallet jack.....						
Total time per case.....			.057			.082
Standard time <sup>3</sup> .....			.066			.094
Standard in hours per week <sup>4</sup> .....			.14			.20

<sup>1</sup> Case count only.

<sup>2</sup> Only merchandise that is not needed for display is unloaded.

<sup>3</sup> Includes a 15-percent personal and fatigue allowance.

<sup>4</sup> Warehouse delivery average 130 cases per week.

TABLE 14.—*List of multi-impression stick stamps recommended for the dairy department in one firm based on analysis of frequency that each stamp was used*

Price on stamp (cents)	Frequency of use	Price on stamp (cents)	Frequency of use
<i>Singles: <sup>1</sup></i>	<i>Percent</i>	<i>Singles: <sup>1</sup></i>	<i>Percent</i>
10.....	5.1	57.....	8.9
16.....	.7	59.....	2.2
19.....	.4	61.....	1.7
20.....	1.6	63.....	1.1
21.....	.6	67.....	4.2
23.....	.8	69.....	10.9
25.....	.4	72.....	6.3
29.....	4.6	73.....	.8
30.....	5.3	74.....	2.2
31.....	1.3	79.....	2.0
32.....	2.3	99.....	.8
33.....	4.1		
35.....	1.9	<i>Multiple: <sup>2</sup></i>	
36.....	2.3	2/27.....	.1
37.....	.7	2/29.....	.8
39.....	4.3	2/33.....	.1
41.....	.3	2/39.....	.6
45.....	1.5	3/100.....	.6
47.....	.3	Subtotal.....	(94.9)
49.....	3.0	Band stamp.....	5.1
52.....	9.2		
55.....	.9	Total.....	100.0

<sup>1</sup> There are 33 single stamps in the set, and they are used on 92.7 of the units priced.

<sup>2</sup> There are 5 double stamps in the set, and they are used on 2.2 of the units priced.

TABLE 15.—*Price marking: Comparison of labor requirements between using a stick stamp set and an adjustable self-inking band stamp*<sup>1</sup>

Elements	Adjustable band stamp			Stick stamp set		
	Standard time	Frequency—based on retail case	Weighted time	Standard time	Frequency—based on retail case <sup>2</sup>	Weighted time
	<i>Minute</i>	<i>Percent</i>	<i>Minute</i>	<i>Minute</i>	<i>Percent</i>	<i>Minute</i>
Obtain band stamp-----	.028	100.0	.028	.028	5.1	.001
Adjust band stamp-----	.098	<sup>3</sup> 81.7	.080	<sup>2</sup> .080	5.1	.004
Stamp with band stamp-----	.012	1,010.0	.121	.012	51.5	.006
Dispose of band stamp-----	.028	100.0	.028	.028	5.1	.001
Obtain stick stamp-----				.032	94.9	.030
Stamp with stick stamp-----				.009	958.5	.086
Dispose of stick stamp-----				.029	5.1	.028
Time per case-----			.257			.156
Standard time <sup>4</sup> -----			.296			.179
Labor cost in cents per case <sup>5</sup> -----			1.421			.859

<sup>1</sup> The average case of dairy merchandise contains 10.1 units.

<sup>2</sup> The stick stamp set has only 38 stamps which covered 94.9 percent of all units priced. The other 5.1 percent of the units had to be priced with a band stamp.

<sup>3</sup> The band stamp is adjusted 81.7 percent of the time.

<sup>4</sup> Includes a 15-percent personal and fatigue allowance.

<sup>5</sup> The wage rate was \$2.50 per hour plus 15 percent for fringe benefits for a total of \$2.88.

TABLE 16.—Standard for pricing and displaying dairy merchandise in multishelf display case located in a retail store <sup>1</sup>

Elements	Elemental time	Frequency	Weighted elemental time
Obtain a four-wheel hand-truck	<i>Minutes</i> 1.460	<i>Percent</i> <sup>2</sup> 6.7	<i>Minutes</i> .098
Load cartons on handtruck	.050	<sup>3</sup> 30.0	.015
Travel to display case	.419	6.7	.028
Obtain case from handtruck	.040	100.0	.040
Carry to display area	.031	100.0	.031
Open carton	.090	100.0	.090
Remove inserts	.067	10.1	.007
Remove merchandise from carton and pre-position	.190	29.2	.055
Obtain band stamp	.028	100.0	.028
Adjust band stamp	.098	81.7	.080
Stamp <sup>4</sup>	.192	100.0	.192
Dispose of band stamp	.028	100.0	.028
Rotation	.287	33.7	.097
Stock <sup>4</sup>	.404	100.0	.404
Position empty cardboard carton on handtruck	.063	100.0	.063
Move handtruck to new location	.241	5.6	.013
Burn cardboard	2.038	4.5	.092
Return handtruck to back-room	.419	6.7	.028
Rearrange merchandise in display case	.698	6.7	.047
Check the price on an item	.369	3.4	.013
Open repack box	.172	2.2	.004
Total time per case			1.453
Standard time per case <sup>5</sup>			1.671
Standard time per unit <sup>4</sup>			.165

<sup>1</sup> It doesn't include milk, cream, butter, eggs, cottage cheese, whips, and ice cream.

<sup>2</sup> The frequency is based on taking 15 cases per trip.

<sup>3</sup> Seventy percent of the merchandise is taken directly to the display area after the delivery.

<sup>4</sup> The number of units per case is 10.1, based on weighted average.

<sup>5</sup> Includes a 15-percent personal and fatigue allowance.

TABLE 17.—Labor requirement per carton for handling eggs at the retail store in a fiberboard and a wire shipping container

Elements	Fiber-board case	Wire case
Obtain and transport to display area	<i>Minutes</i> <sup>1</sup> 0.013	<i>Minutes</i> <sup>1</sup> 0.017
Pricing	.014	.013
Stocking	.048	.012
Rotation	.007	.002
Dispose of empties	.018	.009
Miscellaneous	.002	.002
Total time	.102	.055
Standard time <sup>2</sup>	.117	.063

<sup>1</sup> The time stated for the different functions are adjusted to reflect the difference in container capacity. The fiber case holds 30 one-dozen-egg cartons and the wire case holds 24 one-dozen-egg cartons.

<sup>2</sup> Includes a 15-percent personal and fatigue allowance.

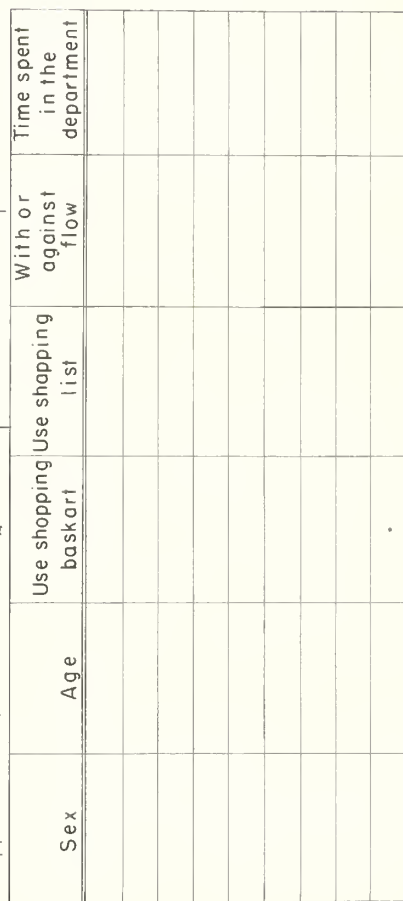
TABLE 18.—Material cost analysis for fiberboard and wire containers

Type of case	Container cost	Trips per week	Cost per trip	Cartons per case	Cost per carton per trip
	<i>Dollars</i>	<i>Number</i>	<i>Cents</i>	<i>Number</i>	<i>Cent</i>
Fiberboard	0.24	4½	5.3	30	0.18
Wire	3.63	150	2.4	24	.10

TABLE 19.—Total labor and material cost per year for handling different volumes of eggs in fiber and wire containers

Cartons per week	Labor and material cost		Savings per year
	Fiber case	Wire case	
<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
1,000	386	209	177
5,000	1,930	1,045	885
10,000	3,860	2,090	1,770
20,000	7,720	4,180	3,540
40,000	15,440	8,360	7,080

Time of day



- Paint where customer stops and looks at on item but does not make a purchase.

FIGURE 8.—Plot sheet for a customer flow study.

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TABLE 20.—Detailed analysis of the effect three different types of display equipment had on overall dairy sales and on some selected items

Type of case	Av. total sales per customer	Av. total sales per customer without dairy sales	Index of total store sales/firm without dairy sales	Av. dairy sales per customer without ice cream	Adjusted av. dairy sales per customer	Total milk, cream and butter sales	
						Average sales	Adjusted sales
Firm A:							
Multishelf—	<i>Dollars</i>	<i>Dollars</i>	<i>Percent</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Store #1.....	6. 43	5. 68	124	75	60	50	40
Store #2.....	5. 12	4. 53	99	59	60	42	42
Store #3.....	5. 03	4. 43	97	60	62	40	41
Door type—					61		41
Store #1.....	5. 06	4. 46	98	60	61	40	41
Store #2.....	4. 60	3. 94	86	66	77	46	53
Store #3.....	4. 85	4. 36	95	49	52	31	33
Total average.....		4. 57	100		63		42
Firm B:							
Multishelf—							
Store #1.....	6. 46	5. 66	105	81	77	51	49
Store #2.....	7. 06	6. 14	113	92	81	58	51
Store #3.....	6. 78	5. 99	111	78	70	45	41
Air curtain—					76		47
Store #1.....	5. 01	4. 38	81	63	78	41	51
Store #2.....	7. 19	6. 45	119	73	61	45	38
Store #3.....	4. 39	3. 87	71	57	80	34	48
Total average.....		5. 42	100		73		46



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